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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,513	09/09/2003	Yuhong Wang	58970.010500	1783
34018 7590 11/20/2007 GREENBERG TRAUIG, LLP 77 WEST WACKER DRIVE SUITE 2500 CHICAGO, IL 60601-1732				
			EXAMINER GATES, ERIC ANDREW	
			ART UNIT 3722	PAPER NUMBER
			MAIL DATE 11/20/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/658,513

Applicant(s)

WANG ET AL.

Examiner

Eric A. Gates

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 5-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/31/07.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 31 October 2007 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakihiro et al. (Japanese Patent 03117507 A) in view of Imanaga et al. (U.S. Patent 4,983,079).

4. Regarding claim 1, Wakihiro et al. discloses a twist drill for forming holes in or through a workpiece, having a longitudinal axis around which the twist drill is rotated and in the direction of which the twist drill is advanced into the workpiece, and two transverse axes disposed perpendicular to each other and to the longitudinal axis, comprising: a shank (not shown but inherent), for enabling the twist drill to be mounted

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to a driving device; a body (not shown but inherent) emanating from, and coaxial with the shank, the body having a radius; at least one flute 5 extending helically along the body; at least one land (not referenced, but next to flute 5 in figure 1) disposed adjacent to the at least one flute 5; and a point structure 1/2 formed on an end of the body distal to the shank, the point structure being generally in the form of a brad point having an extreme tip through which the longitudinal axis of the drill passes, the point structure further having two spur structures (outer tips of cutting lip 2) on opposite sides thereof; a cutting lip 2 on a leading edge of each of the spur structures, the drill further including axial relief surfaces (not labeled, bottom surface seen below surfaces 3 and 4 in figure 2) on trailing surfaces of the lands, the axial relief surfaces being separated from the leading edges of the spur structures by one or more cutting edge surfaces 4, wherein the axial relief surfaces are disposed at a separate, substantially steeper angle, relative to a plane perpendicular to the longitudinal axis of the twist drill, than the one or more cutting edge surfaces; wherein the axial relief surfaces intersect the extreme tip, and extend from the extreme tip radially outwardly, on the trailing surfaces of the lands, to radially outward most positions on the body, wherein the point 1/2 comprises a first radially outwardly disposed portion 4 of the at least one land angling inwardly and axially toward the shank, to a position between a peripheral portion of the body, and the longitudinal axis and a second, radially inwardly disposed portion 3 of the at least one land, angling inwardly and axially away from the shank and toward the central point structure, wherein the second radially inwardly disposed portion of the at least one land is defined at least in part by a point angle α and an angle which represents an axial

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separation between the central point structure and radially outer portions of the at least one land; and the axial separation angle measures approximately 147 degrees on Figure 1 (falls within the 140 to 170 degrees, inclusive, for this claim). Even if it can be argued that this measured angle is not an exact representation of the required angle, as the figures are not necessarily drawn to scale, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have chosen this angle, because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Wakihira et al. does not disclose wherein alpha is between 80 and 97 degrees, instead disclosing alpha as being in the range 98 to 112 degrees. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have slightly modified this angle to a lower value for the purpose of using the drill for an aluminum workpiece, as taught by Wakihira et al., because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Wakihira et al. does not distinctly disclose that the axial relief surfaces and cutting edge surfaces are planar, although it appears that this is the case in figure 1. Imanaga et al. teaches the use of axial relief surfaces and cutting edge surfaces that are planar for the purpose of enabling them to be resharpened by surface grinding. Therefore it would have been obvious to one having ordinary skill in the art at the time

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the invention was made to have combined the drill of Wakihiro et al. with the planar surfaces of Imanaga et al. in order to have a drill that is easier to sharpen.

Wakihiro does not disclose wherein the first radially outward disposed portion of the at least one land is defined at least in part by a leading edge angle and a trailing edge angle, wherein the leading edge angle equals 15 ± 10 degrees (however, this angle is measured at approximately 15 degrees in figure 1) and the trailing edge angle equals 12 ± 7 degrees (this angle is approximately 28 to 30 degrees based on trigonometric calculations using measured dimensions from figures 1 and 2). However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the leading and trailing edge angles to be in the ranges claimed for the purpose of design choice, because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakihiro et al. in view of Crisp (U.S. Patent 2,769,355).

6. Regarding claim 5, the modified invention of Wakihiro et al. discloses the at least one flute terminating in a cutting lip disposed proximate the point; the at least one flute having a sectional configuration, in a plane perpendicular to the longitudinal axis, incorporating a leading edge, a trailing edge, a straight surface extending inwardly from the leading edge (the first portion of cutting edge 2); at least to a position coplanar with a plane passing perpendicularly through the straight surface to the longitudinal axis, and

a first concave curved portion, extending from an inward end of the straight surface.

Wakihira et al. does not disclose a second concave curved portion, extending inwardly from the trailing toward an outer edge region of the first concave curved portion, and a ridge formed by the intersection of the outer edge region of the first concave curved portion and an inner edge region of the second concave curved portion. Crisp discloses a fluted drill that has a first concave curved portion 15 and a second concave curved portion 16 that intersect at a ridge 11 for the purpose of breaking up the cut chips into small pieces. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the drill of Wakihira et al. with the concave flute portions and ridge portion of Crisp in order to have a brad type drill that makes small chips during drilling.

7. Regarding claim 6, the modified invention of Wakihira et al. discloses the invention substantially as claimed.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakihira et al. and Crisp as applied to claims 5 and 6 above, and further in view of Guehring et al. (U.S Patent 6,213,692).

9. Regarding claim 7, the modified invention of Wakihira et al. discloses the invention substantially as claimed, except Wakihira et al. does not disclose the ridge is in the form of a rounded bump. Guehring et al. teaches the use of grooves 18 on a drill that form ridges in the shape of rounded bumps for the purpose of breaking up the cut chips into small pieces. Therefore it would have been obvious to one having ordinary

skill in the art at the time the invention was made to have combined the modified drill of Wakihiro et al. with the rounded bumps of Guehring in order to have a brad type drill that makes small chips during drilling without having stress concentrations at the end of the ridges.

Response to Arguments

10. Applicant's argument concerning the rejection of claim 3, currently incorporated into claim 1, is not persuasive in as much as the angle beta disclosed by Wakihiro et al. was not used for either the leading edge angle or trailing edge angle. However, the Examiner agrees that the measurement of the trailing edge angle from figure 1 was incorrect. This angle has been recalculated using measurements from figures 1 and 2 and standard trigonometric formulas, and the new value has been applied in the rejection of claim 1 above.

11. For the reasons as set forth above, the rejections are maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric A. Gates whose telephone number is (571) 272-5498. The examiner can normally be reached on Mon-Thurs 8:45 - 6:15.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica Carter can be reached on (571) 272-4475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



EAG
14 November 2007


MONICA CARTER
SUPERVISORY PATENT EXAMINER